

## **REMARKS**

Claims 1-142 are now pending in the application.

Applicants note that Claims 139-142 were previously submitted in the Response of August 6, 2007. The Examiner failed to acknowledge or examine Claims 139-142 in the last Office Action. For at least the above reasons, the finality of this Office Action should be removed. The subsequent Office Action should have either a Non-Final or Final status and should not be an Advisory Action.

Although Applicants disagree with the current claim rejections, in the interest of expediting prosecution of the present application and without conceding the issue of patentability Claims 1, 25, 47, 71, 93, 117 and 141-142 are herein amended. The amendments and newly added claims do not introduce new matter since they are supported by the specification of the present application as filed.

Claims 143-147 are added herein.

The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

Applicants would like to thank the Examiner for courtesy extended during the interview on November 15, 2007.

## **REJECTION UNDER 35 U.S.C. § 102**

Claims 25-30, 32-39, 41-45, 47-55, 57-69, 71-76, 78-85, 87-91, 93-101, 103-115, 117-122, 124-131, and 133-137 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Walton et al. (U.S. Pat. No.2005/0002468). This rejection is respectfully traversed.

With respect to Claim 25, Walton does not at least show, teach or suggest a medium access control (MAC) device that includes a link adaptation module that dynamically adjusts a bandwidth of a wireless communications device by adjusting a number of channels, as claimed.

The Examiner relies on different features of Walton to teach the dynamic adjustment of bandwidth. For example, the Examiner broadly defines "bandwidth" to be the capacity for data transfer of an electronic system or the maximum data transfer rate of an electronic system. Although bandwidth can be indicative of the information carrying capacity of a system, bandwidth is not a direct measure of capacity. For example, the capacity of a system may change, while the bandwidth of the system remains constant. An example of this is provided by Walton.

In Walton, different processing schemes may be used for systems with different bandwidths. In other words, a first processing scheme may be used for a first system that has a first bandwidth and low attenuation. A second processing scheme may be used for a second or different system that has a second bandwidth and high attenuation. Walton discloses the adjustment of coding and/or modulation to improve capacity of transmission channels, not to increase bandwidth. Walton does not disclose bandwidth adjustment for a particular system. See paragraphs 37 and 82 of Walton.

In Walton, it is clear that the meaning of "capacity" is different than the meaning of "bandwidth". Capacity is defined in paragraph 37 and bandwidth is referred to in paragraphs 82-84 of Walton. In Walton capacity is defined as the information bit rate for a channel for a particular level of performance, such as bit error rate (BER) or packet error rate (PER). In paragraphs 82-84, Walton refers to a system bandwidth as being

narrow or wide and also refers to narrowband and wideband receivers. Thus, Walton when referring to bandwidth is referring to the width of a band or, in other words, a range of frequencies.

The Examiner alleges that Walton discloses the data rate that is indicative of the maximum data rate that may be transmitted. In Walton, redundancy is introduced. Thus, Walton discusses the capacity and throughput of a system. Walton defines capacity to be the information bit rate or the number of information bits per modulation symbol. See paragraph 37. Walton defines data rate or throughput to be the maximum data rate or bit rate for a channel for a particular level of performance. The particular level of performance refers to the capacity. See paragraphs 37, 208, and 223 of Walton. The terms "capacity", "data rate", and "throughput" are referred to in Walton in association with a particular bandwidth of a system. In Walton, bandwidth is constant for a particular system, whereas capacity, data rate, and/or throughput change.

Thus, Walton clearly fails to disclose or suggest the adjustment of bandwidth by adjusting the number of transmit channels.

As Walton fails to show, teach or suggest dynamic adjustment of bandwidth as claimed, Walton also fails to show, teach or suggest dynamic adjustment of bandwidth based on a transmission error rate and a correlation measurement. As best understood by Applicants, Walton discloses a communication system that adjusts coding and modulation based on signal-to-noise ratio (SNR). Adjusting coding and/or modulation is clearly different than adjusting bandwidth. Coding may refer to a process of converting information obtained on a subject or unit into coded value. Modulation may refer to the

coding of information onto a carrier frequency. Thus, coding and/or modulation may be adjusted without affecting bandwidth.

For anticipation to be present under 35 U.S.C §102(b), there must be no difference between the claimed invention and the reference disclosure as viewed by one skilled in the field of the invention. *Scripps Clinic & Res. Found. V. Genentech, Inc.*, 18 USPQ.2d 1001 (Fed. Cir. 1991).

Therefore, Claim 25 is allowable for at least the above reasons. Claims 71 and 117 are allowable for at least similar reasons as Claim 25. Claims 26-46, 72-92 and 118-138 ultimately depend from Claims 1, 71 and 117 and are allowable for at least similar reasons.

#### **REJECTION UNDER 35 U.S.C. § 103**

Claims 1-9, 11-24, 40, 46, 70, 86, 92, 116, 132, and 138 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Walton et al. (U.S. Pat. No. 2005/0002468) in view of Edwards et al. (U.S. Pat. No. 2004/0059825). This rejection is respectfully traversed.

With respect to Claim 1, Walton and Edwards fail to at least show, teach or suggest a link adaptation module that dynamically adjusts a bandwidth of a wireless communications device based on a transmission error rate and a correlation measurement at a remote wireless communications device.

Applicants have shown above that Walton clearly fails to disclose bandwidth adjustment as claimed.

The Examiner relies on Edwards for the disclosure of a link adaptation device located in a medium access control (MAC) device. Although Edwards may disclose a MAC device, Edwards fails to disclose bandwidth adjustment as claimed. Applicants are unable to find mention of the term bandwidth or any suggestion of bandwidth adjustment in Edwards.

It is a longstanding rule that to establish a prima facie case of obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 USPQ 143 (CCPA 1974), see MPEP §2143.03.

Therefore, Claim 1 is allowable for at least the above reasons. Claims 47 and 93 are allowable for at least similar reasons as Claim 1. Claims 2-24, 48-70, 94-116 and 139-147 ultimately depend from Claims 1, 47 and 93 and are allowable for at least similar reasons.

With respect to Claim 7, Walton and Edwards (US 2004/0059825) fail to at least disclose adjusting spatial multiplexing that is executed by a space-time processor. The Examiner relies on Walton for disclosure of these features. The term "spatial multiplexing" refer to a transmission technique that is used in MIMO wireless communication to transmit independent and separately encoded data signals, so called streams, from each of multiple transmit antennas. The space dimension is reused or multiplexed more than one time. Bits of a data stream are multiplexed over multiple antenna. An increase in spatial multiplexing refers to an increase in the number of streams that can be transmitted in parallel based on the stated multiplexing. An

example of spatial multiplexing is provided in paragraph [0006] of the present application.

The Examiner refers to disclosure of spatial diversity and space-time processing in paragraphs 29, 30 and 60 of Walton. In paragraph 29, Walton simply states that different forms of spatial diversity may be provided via transmit and receive antennas. Spatial diversity simply refers to the use and spacing of more than one antenna. The use of multiple antenna and the spacing thereof is clearly different than the multiplexing of data signals across multiple antenna and the adjustment of such multiplexing.

In paragraph 30, Walton appears to disclose that a system may operate in a diversity mode or a MIMO mode. In the diversity mode data is transmitted from all available antennas. In the MIMO mode data is transmitted and received from all antennas. Again, this does not imply or suggest an adjustment in spatial multiplexing. A system may have spatial diversity on a transmit end and/or a receive end and not use spatial multiplexing.

In paragraph 60, Walton discloses space-time processing of received signals. Applicants submit that this is irrelevant. The separating of received signals (transmitted signals on a received end) does not affect spatial multiplexing, which occurs on a transmit end. Walton is silent with regard to space-time processing on a transmit end and thus clearly does not disclose the adjustment of spatial multiplexing.

Edwards does not disclose spatial multiplexing. Edwards does not disclose transmission by and reception from multiple antennas or the processing associated with such transmission.

Thus, Walton and Edwards fail to disclose the stated features of Claim 7. Claim 7 is further allowable for at least the above reasons.

With respect to Claim 9, Walton and Edwards fail to at least disclose a correlation measurement that is a rank of a channel matrix of a MIMO wireless communications system. As known in the art, the rank of a matrix refers to the number of independent rows or columns of a matrix. A channel matrix may refer, for example, to a NxM matrix that represents characteristics of a channel.

The Examiner relies on Walton for disclosure of the features of Claim 9 and refers to the ranking of SNR values in paragraph 61. Applicants submit that the ranking of SNR values for the selection of a post-processed signal with the highest SNR is clearly different than the rank of a matrix. Walton is silent with regard to the rank of a matrix. Walton does not disclose measurement, determination or use of the rank of a matrix.

Applicants are unable to find any disclosure in Edwards for a rank of a matrix or measurement, determination or use of the rank of a matrix.

Thus, Walton does not disclose adjusting bandwidth based on the rank of a matrix, as recited in Claim 9. Thus, Walton and Edwards fail to disclose the stated features of Claim 9. Claim 9 is further allowable for at least the above reasons.

Claims 10, 31, 56, 77, 102, and 123 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Walton et al. (U.S. Pat. No. 2005/0002468) in view of Edwards

et al. (U.S. Pat. No. 2004/0059825) and further in view of Kitchener et al. (2002/0085643). This rejection is respectfully traversed.

With respect to Claim 10, Walton and Edwards do not at least disclose measurement, determination and/or use of an angle of array (AOA) of a signal for bandwidth adjustment. The Examiner relies on Walton and Kitchener (US 2002/0085643) for this disclosure. As stated above, Walton fails to disclose bandwidth adjustment. Nevertheless, as best understood by Applicants, Kitchener simply discloses that the antenna spacing (spatial diversity) required depends upon the angle of arrival. This is irrelevant, since Claims 1 and 10 recite the adjustment of bandwidth based on the angle of arrival, not the adjustment of spatial diversity based on the angle of arrival.

Thus, Walton, Edwards and Kitchener fail to disclose the stated features of Claim 10. Claim 10 is further allowable for at least the above reasons. Claims 31, 56, 77, 102 and 123 are allowable for at least similar reasons.




## CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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